

9(2).

SOV/112-59-5-9922

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 5,
pp 213-214 (USSR)

AUTHOR: Shkol'nik, G. I.

TITLE: ~~Some Problems of Printed-Circuit Processing~~

PERIODICAL: Radiotekhn. proiz-vo, 1957, Nr 14, pp 3-13

ABSTRACT: In a review of printed-circuit processing, the method of transferring the printed circuits onto the plates is briefly described and the following methods of making printed circuits are compared: (1) etching of foil-covered getinaks; (2) electrochemical deposition of metal on a dielectric; (3) transfer of paper circuit onto the plate. Processing requirements of printed-circuit construction are listed. Substantiation is offered for selecting the conductor width and thickness, clearances between the printed conductors, arrangement of the conductors on the plate, and a rational method of connecting the printed conductors to the hanging components. It is noted that Soviet industry produces

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Some Problems of Printed-Circuit Processing

few components which completely meet the requirements of automatic printed-circuit assembling. General considerations are offered about the selection of material for plates, designing the circuits, and placing the components on the plate. After a circuit has been designed, it is recommended that the current density in the printed conductors, electrical strength between the conductors, the inter-conductor capacitance, and the capacitance between the conductors and the frame be analytically checked. It is recommended that printed circuits be soldered by dipping into molten solder. The solder melting point should be chosen according to the thermal resistance of the plate material; however, this point should always be under 200°C. The working temperature of the bath, where printed circuits are soldered, should be higher by 40-60°C than the solder melting point. The following composition is used as a soldering flux: stearine 30%, paraffin 68%, triethanolamine 2%. Fluxing is performed by dipping the plates into a molten-flux bath at 225-230°C. Various templates are

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Some Problems of Printed-Circuit Processing

needed to protect the plates from contamination during soldering. The plate of a "Start"-TV-set unit that has as many as 280 solder places is fastened to a special device which serves to dip it into the solder bath. The plate is dipped to 50-70% of its thickness. After 2-3 sec, the plate is vibrated with a frequency of 100 cps and an amplitude of 0.1-0.3 mm. Principal schemes of selective-soldering forced-solder-feed outfits and of "solder-wave" outfits are presented.

N.G.K.

Card 3/3

BILA, N.M., inzh.; SHKOL'NIK, G.Ye., inzh, (Kiyev)

Installing 200 l. gasoline tanks on SAK-2G electric welding units.
Stroi. truboprov. 5 no.10:22 0'60. (MIRA 13:10)
(Electric welding) (Gasoline--Transportation)

SHKOL'NIK, G.Ye. (Kiyev)

Method of fastening pipes in piles and during transportation.

Suggested by G.E.Shkol'nik. Stroi.truboprov. 7 no.9:27

S '62.

(MIRA 15:11)

1. Glavnyy mekhanik stroitel'no-montazhnogo upravleniya No.11
tresta Ukgazneftestroy.

(Pipe)

SHKOL'NIK, I.

Complete-set supply for prefabricated buildings. NTO 3 no.12:
42-43 D '61. (MIRA 15:1)

1. Rukovoditel' brigady otдела ekonomiki tresta Mosoblorgstroy.
(Buildings, Prefabricated)

KOTLYARSKIY, L.B.; SHKOL'NIK, I.E.

Piezomodulus measurement by the falling ball method. Akust.
zhur. 9 no.2:238-239 '63. (MIRA 16:4)

1. Proyektno-konstruktorskiy tekhnologicheskii institut,
Kishinev. (Piezoelectricity—Measurement)

L 06590-67 EWT(d)/EWT(m)/EWP(w)/EWP(j)/EWP(t)/ETI/EWP(k) IJP(c) JD/EM/RM/JH
 ACC NR: AP6029852 (N) SOURCE CODE: UR/0032/66/032/008/0962/0965

AUTHOR: Budenkov, G. A.; Nikiforenko, Zh. G.; Shkol'nik, I. E.

ORG: All-Union Scientific Research Institute for the Development of Nondestructive
 Methods and Means of Controlling the Quality of Materials (Vsesoyuznyy nauchno-issle-
 dovatel'skiy institut po razrabotke nerazrushayushchikh metodov i sredstv kontrolya
 kachestva materialov)

TITLE: An estimate of the stress state of a material with the aid of ultrasound

SOURCE: Zavodskaya laboratoriya, v. 32, no. 8, 1966, 962-965

TOPIC TAGS: stress analysis, ultrasonic wave, ultrasonic wave propagation, anisotropic
 medium, elasticity theory, elastic stress

ABSTRACT: A method was developed for determining the mechanical stress in solid bodies
 according to their anisotropic parameters. Third-order nonlinear elastic equations
 were given relating stress to deformation and to the speed of three-dimensional shear
 waves. The latter equations showed that in the presence of stress, solid bodies are
 governed by anisotropic elasticity. The experimental and theoretical dependence be-
 tween elastic stresses and the shear parameters of elastic oscillations in various ma-
 terials was developed from the frequency ultrasonic polarization method of measuring
 internal stresses in solids. Elastic anisotropy was determined by measuring the fre-

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UDC: 620.179.16

DRUZHININ, N.S.; TSYLBOV, P.P.; SHKOL'NIK, K.A.

[Drawing course. Part 1; geometric drawing (drawing technique and geometric structures)] Kurs chercheniia. Chast' 1; geometricheskoe cherchenie (tekhnika chercheniia i geometricheskie postroeniia). Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1953- . (MLBA 6:8)
(Geometrical drawing) (Mechanical drawing)

SHKOL'NIK, K.A.

DRUZHININ, N.S.; TSYLBOV, P.P.; SHKOL'NIK, K.A.; SHCHUKIN, S.M., dotsent, retsenzent; SHIKIN, S.V., kandidat pedagogicheskikh nauk, retsenzent; SHKOL'NIKOV, G.I., inzhener, redaktor; MODEL', B.I., tekhnicheskii redaktor; POPOVA, S.M., tekhnicheskii redaktor

[Course in mechanical drawing] Kurs chercheniia. Izd. 2-e, ispr. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry. Pt.1. [Geometric drawing; mechanical drawing technique and geometric construction] Geometricheskoe cherchenie; tekhnika chercheniia i geometricheskie postroeniia. 1954. 220 p. (MLRA 7:9)
(Mechanical drawing)

DRUZHININ, Nikolay Sergeyevich; TSYLBOV, Petr Petrovich; SHKOL'NIK,
Konstantin Abramovich; SHCHUKIN, S.M., dotsent, retsenzents;
SHIKIN, S.V., kand.pedagog.nauk, retsenzents; SHELEKOVNIKOV,
G.I., inzh., red.; SMIRNOVA, G.V., tekhn.red.

[Course of drawing] Kurs chercheniia. Izd.3., ispr. Moskva,
Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry. Pt.1. [Geo-
metrical drawing; drawing practice and geometrical constructions]
Geometricheskoe cherchenie; tekhnika chercheniia i geometricheskie
postroeniia. 1960. 176 p. (MIRA 13:7)
(Geometrical drawing)

USSR

'8627' Uralite Insulators for Auto and Tractor Spark Plugs.
Isoliatory iz uranita dlia avtotraktornykh zapal'nykh sve-
chel. (Russian.) A. D. Usanov and Kh. M. Shkol'nik. Auto-
mobil'naya i traktornaya promyshlennost', 1958, no. 4, 14.
p. 15-16.
Chemical composition; physico-chemical properties; effect of
heat treatment. Graphs, tables, photograph.

SHKOL'NIK, L. (Aktyubinsk).

New developments in production. Prom.koop.no.11:33 N '56.
(Aktyubinsk--Cooperative societies) (MLRA 9:12)

SHKOL'NIK L.M.

SHKOL'NIK, L.M., inzhener; KOROTCHENKO, V.V., inzhener

Experience in making balance arm fulcrums for locomotive suspension
spring using band steel. Tekh.zhel.dor.7 no.7:27-28 J1'48.
(Locomotives) (MLRA 8:11)

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																																																			
<p>On the Method of Determining Residual Stresses Caused by Shot-Peening. L. M. Shkolnik. (Zavodskaya Laboratoriya, 1949, vol. 15, Oct., pp. 1232-1239). [In Russian]. Experiments are described in which prismatic specimens of different steels, $15 \times 15 \times 120$ mm., were shot-peened under various conditions. The distribution of residual stress was then determined by removing successive thin layers from the specimen by treatment with nitric acid and determining the change in the curvature of the specimen taking place at each removal. The influence of the size of the shot, of the hardness of the steel and of the specimen thickness on the results of shot-peening are discussed on the basis of the results obtained, and the nature of the fracture occurring in shot-peened and untreated gear teeth are compared.—N. K.</p>																																																			
ASB-11A METALLURGICAL LITERATURE CLASSIFICATION																																																			
COMMON ELEMENTS																																																			
COMMON VARIANTS INDEX																																																			

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EXPERIMENTAL UTILIZATION OF A "PULSATOR" FOR ENDURANCE TESTING OF GEAR TEETH. (In Russian.) R. S. Nikolaev and L. M. Shkol'nik. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 15, Oct. 1949, p. 1264-1265.

Describes modified apparatus intended to render conditions of testing more similar to those actually encountered in service.

ASME-STEEL METALLURGICAL LITERATURE CLASSIFICATION

SHKOL'NIK, L. A. and V. P. DEVIATKIN

Povyshenie prochnosti shesteren drobestruinym naklepom. (Vestn. Mash., 1950, no. 12, p. 7-12)

Includes bibliography.

Increased strength of gears by shot method.

DLC: TM4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

SHKOL'NIK, L. M.

FD 374

USSR/Physics - Stress Analysis, Stress Concentration

Card 1/1

Author : Shkol'nik, L. M.

Title : Effect of single and grouped concentrators of stresses in regard to the extent of cyclic overloading

Periodical : Zhur. tekhn. fiz. 24, 517-526, Mar 1954

Abstract : Discusses results of fatigue tests performed on notched specimens made of open-hearth and converter steels in forged, cast and rolled conditions. Establishes that effect of stress concentrators on strength of metal under cyclic loading depends on degree of overloading. Studies character of changes in values of the factor of stress concentration under influence of number of notches, their distribution and properties of metal. Four references, all USSR; one 1936, others 1945-1953. Graphs, illustrations, tables.

Institution :

Submitted : July 10, 1953

SHCHAPOV, N.P., professor, doktor tekhnicheskikh nauk; SHKOL'NIK, L.M.,
kandidat tekhnicheskikh nauk; SKAKOV, A.I., kandidat tekhnicheskikh
nauk; KALASHNIKOVA, Z.V., inzhener

Selecting material and heat treatment methods for rail fishplates.
Trudy TSNII MPS no.85:73-114 '55. (MIRA 8:11)
(Railroads--Rails)

SHKOL'NIK, L.M.

SKAKOV, A.I., kandidat tekhnicheskikh nauk; SHKOL'NIK, L.M., kandidat
tekhnicheskikh nauk

Results of investigations of mass-produced rail chairs. Trudy
TSNII MPS no.85:137-145 '55. (MIRA 8:11)
(Railroads--Rails)

SKAKOV, A.I., kandidat tekhnicheskikh nauk; SHKOL'NIK, L.M., kandidat
tekhnicheskikh nauk; LYUTINA, V.R., inzhener

Results of studies on heat treated track bolts. Trudy TSNII MPS
no. 85:160-175 '55. (MLRA 8:11)
(Railroads--Equipment and supplies)

SHKOL'NIK, L.M.
SKAKOV, A.I., kandidat tekhnicheskikh nauk; *SHKOL'NIK, L.M.*, kandidat
tekhnicheskikh nauk

Results of studies on mass-produced rail spikes. Trudy TSNII MPS
no.85:176-179 '55. (MLRA 8:11)
(Railroads--Rails--Fastenings)

SKAKOV, A.I., kandidat tekhnicheskikh nauk; SHKOL'NIK, L.M., kandidat tekhnicheskikh nauk.

Comparative evolution of the mechanical properties and strength of experimental rails. Trudy TSNII MPS no.111:40-83 '55.
(MLRA 9:5)

(Railroads--Rails)

SHKOL'NIK, L.M., kandidat tekhnicheskikh nauk.

The mechanical properties of fishplates and the strength of rail joints. Trudy TSNII MPS no.111:136-146 '55. (MLRA 9:5)
(Railroads--Rails)

SHKOL⁹NIK, L.M., kandidat tekhnicheskikh nauk.

Effect of arsenic in rails on their fatigue strength. Metalloved. i
obr. met. no.2:14 21 F '56. (MLRA 9:7)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo
transporta.
(Railroads--Rails--Testing) (Arsenic)

SOV/124-58-3-3478

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 126 (USSR)

AUTHOR: Shkol'nik, L. M.

TITLE: Analysis of the Causes of Fractures at the Center Portion of Railroad-car Axles and Measures for Necessary Reinforcement (Analiz prichin izlomov vagonnykh osey v sredney chasti i meropriyatiya po ikh uprochneniyu)

PERIODICAL: Vestn. Vses. n.-i. in-ta zh.-d. transp., 1956, Nr 3, pp 25-30

ABSTRACT: An analysis was conducted of the failures of 48 axles; the fatigue strength of the axles was determined. The results of the study substantiated the conclusion that the central portion of the axle must be turned to a smooth facing and then cold hardened.

N. P. Shchapov

Card 1/1

SKAKOV, A.I., kandidat tekhnicheskikh nauk; SHKOL'NIK, L.M., kandidat tekhnicheskikh nauk.

Specifications for Type P 65 heavy rails. Tekh.zhel.dor.l5 no.2:
12-15 Mr '56. (MLRA 9:7)
(Railroads--Rails)

SHKOL'NIK, I.M., kandidat tekhnicheskikh nauk.

Effect of arsenic on the toughness of rail steel. Stal' 16 no.6:
548-553 Je '56. (MLRA 9:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozh-
nogo transporta.

(Steel alloys--Testing) (Arsenic)

SHKOL'NIK, L.M.
KRAYCHIK, M.M.; SHKOL'NIK, L.M.; MAYSNER, B.A.

Method for fatigue bending tests on weldments. Zav. lab.
22 no.12:1472-1479 '56. (MLRA 10:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo
transporta.
(Metals--Testing) (Welding--Testing)

SHKOL'NIK, L.M.

28-58-2-33/41

AUTHOR: Shkol'nik, L.M., Candidate of Technical Sciences

TITLE: On the Quality of Railway Fish Plates (O kachestve stykovykh rel'sovykh nakladok)

PERIODICAL: Standartizatsiya, 1958, Nr 2, pp 79-81 (USSR)

ABSTRACT: The article contains information on the mechanical properties of fish plates for rails of different gages ("R43", "R50" and "R65"), produced by three plants - Kuznetskiy metallurgicheskiy kombinat (Kuznetsk Metallurgic Combine), "Azovstal'", and Makeyevskiy zavod imeni Kirova (Makeyevka Plant imeni Kirov). Technological recommendations designed for improvement of the quality of unsatisfactory fish plates are given. The mechanical properties of the fish plates originating from the three plants are given and compared in 7 diagrams. It is stressed that heat treatment for fish plates for rails of different gages must be different, and the steel used for these fish plates as well. Experimental production of still heavier gage rails than "R65" (gage "R75") started in 1957. There are 7 graphs and 1 table.

Card 1/2

On the Quality of Railway Fish Plates

28-58-2-33/41

ASSOCIATION: TsNII MPS

AVAILABLE: Library of Congress

Card 2/2 1. Railroads-Equipment-Standards 2. Standardization-USSR

SHKOL'NIK, L.M., kand.tekhn.nauk

Macrostructure of car axles as a factor determining their operational
reliability. Vest. TSNII MPS [7] no.3:26-30 My '58. (MIRA 11:6)
(Car axles--Testing)

SHKOL'NIK, L.M., kand. tekhn. nauk.

Effect of arsenic on the mechanical properties of rail metal and
results of investigating the fatigue strength of rails. Trudy TSNII
MPS no.154:78-109 '58. (MIRA 12:1)
(Railroads--Rails) (Arsenic)

SHKOL'NIK, L.M., kand. tekhn. nauk; KALASHNIKOVA, Z.V., inzh.

Quality of R-65-type rails. Trudy TSNII MPS no.154:160-180
'58.

(Railroads--Rails)

(MIRA 12:1)

SHKOL'NIK, L.M., kand. tekhn. nauk; LYUTINA, R.V., inzh.

Investigating the quality of fishplates used with heavy-
type rails. Trudy TSNII.MPS no.154:181-194 '58. (MIRA 12:1)
(Railroads--Rails--Fastenings)

FRASE I 3006 EXPLOITATION 307/315

Abadskaya, N. S. Institut Mashinovedeniya

Voprosy prochnosti materialov i konstruktivnykh problem (Problems of Strength of Materials and Structures) Moscow, 1959. 200 p. 22 cm. 500 copies printed.

Resp. Ed.: D. N. Reshetov, Professor, Doctor of Technical Sciences; Ed. of Publishing House: G. B. Gorbunov; Tech. Ed.: S. T. Shikin.

PURPOSE: This book is intended for engineers and scientists concerned with the problems of the strength of materials and construction.

COVERAGE: The book contains 28 articles on the strength of materials in general and of machine construction in particular. This collection was prepared under the direction of the Institute of Mechanical Engineering of the AS USSR in honor of Sergey Vladimirovich Serensen, one of the founders and directors of the National School of Strength of Materials, who recently completed 30 years of scientific activities. The previous gives a short sketch of his life and professional activities. The collection is divided into two parts. The first part contains 13 articles on general problems of strength and the strength of machine construction materials. The second part contains 15 articles on dynamics and calculation of strength and rigidity. There are references at the end of each article.

Yegorov, R. D., and G. I. Shishorina. Effect of Concentrating Stresses Under the Action of Varying Loads 36

Pisarenko, G. S. Problem of the Strength of Brittle Materials Produced by the Methods of Powder Metallurgy 52

Zil'ber, E. I., and Ya. B. Fridman. Delayed Decomposition of Materials and the Effect of the Reserve of Elastic Energy 63

Nikolayev, G. A., and S. V. Rumyantsev. Effect of Welding Defects on the Mechanical Properties of Welds 62

Shkolnik, I. M. Dependence of Endurance and Durability on the Characteristics of Static Strength 92

Krasovskiy, O. Yu. Fatigue Resistance of Cast Iron During Repeated Overloadings 111

Zakharov, T. P. Fatigue and Continuous Strength of Alloys for Turbine Blades under Conditions of Simultaneous Action of Static and Variable Stresses 123

Fridman, Ya. B., and Ya. M. Morozov. Mechanical Properties of Bimetals Under Atrial Loadings of Surface Riveted Bars 144

Kogayev, V. P., and T. A. Bolsh. Construction of a Complete Fatigue Diagram 153

156 15

AUTHOR: Shkol'nik, L.M., Candidate of Technical Sciences ^{SOV/133-59-5-23/31}

TITLE: The Influence of Straightening on the Properties of High-carbon Heavy Rails of the R-65 Type (Vliyaniye pravki na svoystva vysokouglerodistyykh tyazhelykh rel'sov tipa R-65)

PERIODICAL: Stal', 1959, Nr 5, pp 451 - 456 (USSR)

ABSTRACT: An investigation of the influence of cold straightening on the strength properties of R-65 rails has been carried out. Straightened and unstraightened rails made from the same heat (C 0.73%, Mn 0.88%, Si 0.21%, P 0.040%, Cu 0.11%) and cooled under the same conditions were taken for the investigation. It was found that cold straightening of rails leads to an increase in the static strength and to a decrease in plasticity of the metal; the impact strength of rails remains practically unchanged. The fatigue limit of the metal from heads of straightened rails is higher and of the metal from the neck lower than in untreated rails. In the absence of defects of metallurgical or operational origin in the rail neck the probability of their appearance either in straightened or unstraightened rails is apparently very small. Defectoscopic examination of the heads and

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The Influence of Straightening on the Properties of High-Carbon
Heavy Rails of the R-65 Type

SOV/133-59-5-23/31

necks of rail specimens carried out during fatigue testing indicated that with an increasing level of acting stresses the "relative life" of the metal increases. This can be explained by the same causes as those which decrease the negative influence of stress concentrators with increasing degree of cyclic overloading (Ref 7). There are 8 figures, 4 tables and 7 Soviet references.

ASSOCIATION: Vsesoyuznyy n.-i. institut zheleznodorozhnogo transporta (All-Union Scientific Research Institute for Railway Transport)

Card 2/2

FRIDMAN, Ya.B.; GORDEYEVA, T.A.; ZAYTSEV, A.M.; GOL'DENBERG, A.A., kand.
tekhn.nauk, retsenzent; SHKOL'NIK, L.M., kand.tekhn.nauk, red.;
DOBRITSINA, R., tekhn.red.; UVAROVA, A.F., tekhn.red.

[Structure and analysis of various types of metal fracture]
Stroenie i analiz izlomov metallov. Moskva, Gos.nauchno-tekhn.
izd-vo mashinostroit.lit-ry, 1960. 127 p. (MIRA 13:3)
(Metallography)

SHREVE, J. M.

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Investigation of the problem of the

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Articles. In the problem of the

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VK/mib/exp
9-1-60

(14)

Card 1/1

SHKOL'NIK, L.M., kand.tekhn.nauk

Contact damages of railheads. Vest.TSNII MPS 19 no.2:42-
45 '60. (MIRA 13:6)
(Railroads--Rails) (Strains and stresses)

SUKOL'NIK, L.M., kand.tekhn.nauk

Cause for the appearance of nicks and transverse cracks in rail heads. Stal' 20 no.6:557-558 Jo '60. (MT-A 14:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta.

(Railroads--Rails)

(Steel--Defects)

SHKOL'NIK, L.M.

High-precision axles for railroad rolling stock. Standartizatsia
24 no.12:40-42 D '60. (MIRA 13:11)
(Railroads--Rolling stock--Standards)

SHKOL'NIK, L.M., kand.tekhn.nauk; SHAKHOV, V.I., inzh.

Lengthening the life span of axles and shafts. Vest. TSNII
MPS 20 no.6:35-38 '61. (MIRA 14:10)
(Metals--Fatigue)
(Railroads--Rolling stock)

5/124/62/000/007/023/027
0234/0308

AUTHOR: Shkol'nik, L. M.

TITLE: Dependence of durability on characteristics of static strength

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 7, 1962, 58, abstract 7V451 (V sb. Vopr. prochnosti materialov i konstruktsey, M., AN SSSR, 1959, 92-110)

TEXT: With the aid of statistical methods the author studies the influence of the characteristics of static strength of a material σ_B , σ_s , S_k on the durability and the limit of durability σ_{-1} in carbon steels overloaded in forged and cast state. It is established that the dependences between durability at σ larger than σ_{-1} and the characteristics of mechanical properties of steel differ from similar dependences between σ_{-1} and the same characteristics of mechanical properties. The effect of separate characteristics of

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S/124/62/000/007/023/027
D234/D308

Dependence of durability ...

Mechanical properties on durability is changed by the degree of cyclic overloading and the level of acting stresses. The results show that the choice of material for long-term operating components by the results of their short-period tests at stresses considerably larger than working stresses can in several cases lead to false conclusions. The highest accuracy is obtained by calculating σ_{-1} from the equations $\sigma_{-1} = f(\sigma_s, \sigma_B, S_k)$, the specific weight of σ_B and S_k in these equations being larger than that of σ_s . The structure of formulas expressing the total effect of static strength characteristics on σ_{-1} is different for steels having different strength. For soft steel in smooth specimens, the closest connection is established between σ_{-1} and σ_B , and for notched specimens with σ_s . For high strength steels in smooth specimens the closest relation is established between σ_{-1} and true breaking strength. The relation between σ_{-1} and durability of steels in smooth specimens

Card 2/3

Dependence of durability ...

S/124/62/000/007/023/027
D234/D308

with static strength properties is closer than for the same steels
with notches. / Abstracter's note: Complete translation. _7

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S/122/62/000/006/003/003
D262/D308

AUTHORS:

Shakhov, V.I., Engineer, and Shkol'nik, L.K., Candidate of Technical Sciences

TITLE:

Selection of technological parameters of surface rolling with respect to residual stresses

PERIODICAL:

Vestnik mashinostroyeniya, no. 6, 1962, 60 - 63

ABSTRACT: The Vsesoyuznyy-nauchno-issledovatel'skiy institut zh.-d transporta (All-Union Scientific Research Institute of Railway Transportation Engineers) has conducted a number of experiments in order to establish the effect of technological factors of the surface rolling operation on the residual stresses in the carriage axles. A pneumatically operated two-roller device, having one exchangeable reinforcing roller of 100, 130 or 150 mm dia. with convex profiles of 5, 12 and 24 mm radii, and one constant smoothing roller of 100 mm dia. was used, and all three components of the bulk stress state: Axial, circumferential, and radial stresses, were measured without referring to extrapolation. The results of the experiments recorded in the form of graphs and analyzed in detail revealed the following: The

Card 1/2

Card

SHKOL'NIK, L.M., kand.tekhn.nauk

Nature and characteristics of the development of shelling and
transverse cracking of rail head sides. Trudy TSNII MPS no.220:
32-48 '61. (MIRA 15:1)
(Railroads--Rails--Defects) (Strains and stresses)

TSUFANOV, P.P., kand.tekhn.nauk; SHKOL'NIK, L.M., kand.tekhn.nauk

Effect of carbon and manganese content of rail steel on the formation or rail defects 82 and 84. Trudy TSNII MPS no.220:70-85 '61.
(MIRA 15:1)

(Railroads--Rails--Defects)

SHKOL'NIK, L.M., kand.tekhn.nauk

Methodology of estimating the service life of parts in operation.
Vest.TSNIIMPS 21 no.7:55-58 '62. (MIRA 5:12)
(Strenght of materials)

IVANOVA, Vera Semenovna. Prinimal uchastiye GORDIYENKO, L.K.,
kand. tekhn. nauk; SHKOL'NIK, L.M., kand. tekhn. nauk, red.;
GORDON, L.M., red. izd-va; MIKHAYLOVA, V.V., tekhn. red.

[Fatigue failure of metals] Uсталостное разрушение металлов.
Moskva, Metallurgizdat, 1963. 272 p. (MIRA 16:12)
(Metals--Fatigue)

ACCESSION NR: AT4014054

S/3073/63/000/000/0270/0274

AUTHOR: Shkol'nik, L. M.; Shchapov, N. P.; Savel'yeva, R. A.; Lyutina, R. V.

TITLE: Effect of cyclic loading on the hydrogen concentration in steel

SOURCE: Prochnost' metallov pri peremennykh nagruzkakh; materialy* tret'yego soveshchaniya po ustalosti metallov, 1962 g. Moscow, Izd-vo AN SSSR, 1963, 270-274

TOPIC TAGS: steel alloy, loading, cyclic loading, stress, plastic deformation, steel, hydrogen, metal fatigue

ABSTRACT: The concentration of hydrogen in steel is known to affect its structure and properties. The effects of cyclic loading on the concentration of hydrogen in console-type and rail-type steel was investigated using two devices at 66-1400 cycles/minute, the hydrogen concentration being determined by gas analysis. The rupture strength at these frequencies was also determined. This procedure showed that during cyclic loading, the concentration of H is decreased, its desorption from the metal is accelerated, and its mobility is increased. The concentration of H, however, increases in the area of the highest stress. This depends on the duration of the cyclic loading and not on maximum level in the exposed cross section, although the rate of diffusion of H is increased by plastic deformation.

Card 1/2

ACCESSION NR: AT4014054

Orig. art. has: 7 figures.

ASSOCIATION: None

SUBMITTED: 00

SUB CODE: MM

DATE ACQ: 20Feb64

NO REF SOV: 000

ENCL: 00

OTHER: 000

Card 2/2

L 40726-65 EWT(d)/EWT(m)/EWP(w)/EWP(c)/EWA(d)/EWP(v)/I/EWP(t)/EWP(k)/EWP(h)/
EWP(b)/EWP(1)/EWA(c) Pf-4 JD/HW

ACCESSION NR: AP5012128

UR/0231/64/000/008/0036/0039

AUTHOR: Vlasov, V. I. (Candidate of technical sciences); Shkol'nik, L. M.
(Candidate of technical sciences); Lyutina, R. V. (Engineer)

TITLE: Increasing rail strength in the bolt zone

SOURCE: Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhno
transporta. Vestnik, no. 8, 1964, 36-39

TOPIC TAGS: fabricated structural metal, railway track

Abstract. The following measures are recommended for increasing the fatigue strength of rails in the area of a bolt hole. 1. The rails should be made with round holes only since oval holes lower the fatigue strength of the rails. 2. The edges of all holes in new industrially produced rails should be bevelled. This applies to holes drilled in old rails as well. 3. The rails should be strengthened by cold working the metal of the web, expanding the holes with a punch which has a tapered end and a cylindrical calibration section. For type R-50 rails, a 0.5 mm expansion provides an extremely large increase in the fatigue durability of the rails. Both untreated rails and those which have been case hardened or completely hardened need additional strengthening. The factories where the rails are rolled and the repair shops should be equipped

Card 1/2

L 40726-65

ACCESSION NR: AP5012128

with presses for strengthening the rails. Small presses (15-20 tons) are required for strengthening. Orig. art. has 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: IE

NO REF SOV: 002

OTHER: 000

JPRS

Card *ce*
2/2

GORDINSKIY, B.Yu., kand. khim. nauk; GAYEVSKIY, A.F., kand. tekhn. nauk;
SHIMANSKIY, V.M., kand. tekhn. nauk; SHKOL'NIK, S.I., inzh.

Packing gland for reactors operating in a vacuum. Khim. i
neft. mashinostr. no.3&35 S '64. (MIRA 17:12)

VLASOV, V.I., kand. tekhn. nauk; SHKOL'NIK, L.M., kand. tekhn. nauk;
LYUTINA, R.V., inzh.

Increasing the fatigue strength of rails in the zone of the
bolt holes. Vest. TSNII MPS 23 no.8:36-39 '64 (MIRA 18:2)

SHKOL'NIK, L.M., kand. tekhn. nauk; BERESTOVOY, Ye.I., inzh.,
retsensent; SARANTSEV, Yu.S., inzh., red.; KHITROVA,
N.A., tekhn. red.

[Increasing the strength of the axles of the rolling
stock] Povyshenie prochnosti osei zheleznodorozhnogo
podvizhnogo sostava. Moskva, Izd-vo "Transport," 1964.
223 p. (MIRA 17:3)

SHKOL'NIK, I.M., kand. tekhn. nauk; SHCHETININ, D.D., Inzh.

Increasing the fatigue strength of cast iron crankshafts. Vest.
TSNII MPB 23 no.4:35-38 '64. (MIRA 17:8)

L 63019-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) Pf-4 JD/HW

ACCESSION NR: AR5012746

UR/0276/65/000/003/B052/B053
621.787.4:621.81

SOURCE: Ref. zh. Tekhnologiya mashinostroyeniya. Svochnyy tom, Abs. 3B393

AUTHOR: Shkol'nik, L. M.

TITLE: Residual stresses in thick-walled tubular parts in connection with increasing their fatigue strength by rolling

CITED SOURCE: Sb. Korrozion. ustalost' metallov. L'vov, Kamenyar, 1964, 203-216

TOPIC TAGS: residual stress, fatigue strength

TRANSLATION: The differences between the curves of the residual peripheral compression stresses in solid and hollow tubular specimens depending on the rolling force were established. Significant residual stresses develop in thick-walled tubular sections with rolling. The residual stress in hollow specimens is almost always greater than that in solid ones. The effects of the wall thickness on the residual stresses developing with rolling were evaluated by varying this parameter. The residual stress curves contract with decreasing wall thickness, with their general lengthening characterizing the increase of the maximum

Card 1/2

L 63019-65

ACCESSION NR: AR5012746

0
values of residual stresses. The dependence between the residual stresses and the rolling forces for hollow sections is less sharply expressed than for solid sections. The residual stresses increase with increasing internal and external diameters of the tubular specimens (while maintaining the constant wall thickness). The investigation procedure is given. The characteristics of residual peripheral compression stresses developing with rolling of solid and hollow specimens are given. 6 illus., 1 table, 7 bibliographic entries.

SUB CODE: AS, MM

ENCL: 00

dm
Card 2/2

L 34833-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l) IJP(c) EM/DJ/BC
 ACC NR: AP6014336 (N) SOURCE CODE: UR/0122/65/000/012/0045/0048

AUTHOR: Shkol'nik, L. M. (Candidate of technical sciences); Shakhov, V. I. (Candidate of technical sciences); Shchetinin, D. D. (Engineer)

ORG: None

TITLE: Roller-hardening large crankshafts 1

SOURCE: Vestnik mashinostroyeniya, no. 12, 1965, 45-48

TOPIC TAGS: work hardening, surface hardening, compressive stress, buckling, plastic deformation, fatigue strength, engine crankshaft

ABSTRACT: A method is described for roller-hardening crankshaft chamfers. The rolling is done on standard lathes with a special attachment (see figure). The shaft is hardened during rotation. The attachment is counterbalanced by weights and does not exert an unbalanced load on the shaft during machining. The absence of a nonuniform load on the shaft is a significant factor in reducing shaft deformation during hardening. A semi-automatic control device was incorporated to distribute the load evenly during hardening. The basic stress parameters of hardened crankshaft necks are taken as the maximum values of the surrounding residual compression stresses and the cross sectional depth of their effectiveness. Maximum residual compression stresses increase with machining stresses in the surface layers at a depth of 2 to 5 mm from the surface.

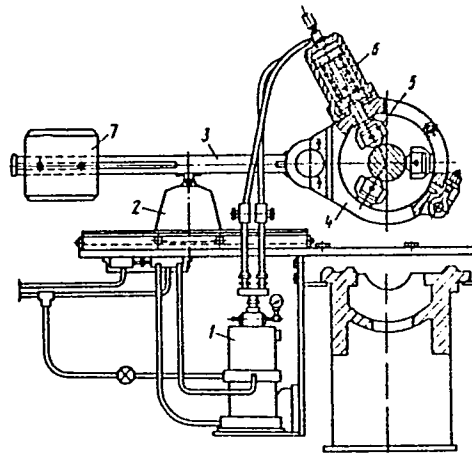
Card 1/3

UDC: 621.787-233.13

L 34833-66

ACC NR: AP6014336

Tests are performed to determine fatigue limits to find the optimum hardening process. It is shown that chamfer hardening raises the limit of fatigue by a factor of 1.8-1.9. Buckling is caused by residual stresses due to plastic deformation in the surface layer of the crankshaft metal during roller hardening of the chamfers. Comparative tests are performed to determine durability and service life. The tests show that critical temperatures appear in necks with various machined surfaces under uneven loading. Necks which are lapped after grinding or hardening take a greater load on the bushing than necks which are hardened after grinding or lapping. Inserts which are hardened after grinding take 1120 to 1220 kgf load on a bushing. Inserts which are work hardened after grinding take a load of 1420 kgf and those lapped after



Device for roller hardening crankshaft chamfers: 1--pneumohydraulic amplifier; 2--trolley; 3--guide rail; 4--split clamp; 5--roller; 6--hydraulic cylinder; 7--counterweight

Card 2/3

L 34833-66

ACC NR: AP6014336

hardening or after grinding take a load of 1620 kgf on the bushing. Bushings with necks which were lapped after hardening are much more durable than bushings where the necks were lapped after grinding. It is recommended that crankshaft necks should be lapped after hardening. Orig. art. has: 6 figures.

SUB CODE: 13/ SUBM DATE: 00/ ORIG REF: 002/ OTH REF: 000

Card 3/3 FV

GAIDUK, G.P. [Gaiduk, G.P.]; ZATULOVSKIY, B.S. [Zatulovskiy, B.S.];
SHKOL'NIK, L.Va. [Shkol'nyk, L.Va.]

Electron microscopic study on *Rickettsia prowazekii* in ultrathin
sections of the yolk sac. Mikrobiol. zhurn. 46 no.2:58-63 '64.

(MIRA 18:8)

1. Institut epidemiologii i mikrobiologii Ministerstva
Zdrav. Kraevnaya, Kiev.

L 28431-66 EWT(1)/T JK

ACC NR: AP6019123

SOURCE CODE: UR/0016/65/000/011/0138/0139

AUTHOR: Zatulovskiy, B. G.; Sokol, A. S.; Bondarenko, V. I.; Chernaya, T. T.;
Shkol'nik, L. Ya.; Bogachik, L. I.

33
B

ORG: Kiev Institute of Epidemiology and Microbiology (Kiyevskiy institut epidemiologii i mikrobiologii); Kiev Medical Institute im. Bogomolets (Kiyevskiy meditsinskiy institut); Zaporozh'ye Institute for the Advanced Training of Physicians (Zaporozhskiy institut usovershenstvovaniya vrachey)

TITLE: Ornithosis in some Ukrainian cities

SCURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 11, 1965, 138-139

TOPIC TAGS: epidemiology, antibody

ABSTRACT: The purpose of the investigation was to detect patients with ornithosis and to study the epidemiological and clinical characteristics of the cases discovered, mainly in Kiev and Zaporozh'ye. Twenty cases were discovered among 640 patients and convalescents from diseases with various diagnoses (influenza, pneumonia, typhoid, meningoencephalitis, etc.)

The onset of the diseases was generally abrupt, with elevated temperature and chills, headache, chest pain, and dry cough. Some patients complained of nausea and vomiting, loss of appetite, and insomnia. The feverish period ranged from 6 days to 2-3 weeks. The lungs were involved in al-

Card 1/2

UDC: 616.988.73

L 28431-66

ACC NR: AP6019123

most all cases. Inflammatory foci were found within a day or two after admission to the hospital. The time that complement-fixing antibodies appeared and the height of the titers varied from person to person. ()

Epidemiological investigation revealed that, with the exception of a single family, the disease was random. Although many individuals were hospitalized late, none of their family or friends contracted the disease, the principal source of which was pigeons. [JPRS]

SUB CODE: 06/ SUBM DATE: 17Dec64

Card 2/2

28

SHKOL'NIK, I.Ye.; ZATUCHENIY, B.G. [Zatuchens'kyi, B.H.]; GANDZIY, G.P.
[Gandziy, G.P.]

The electron microscopic study of Prokubek's Rickettsia in the
intestinal cells of the body louse. Mikrobiol. zhur. 27 (MIRA 18:5)
no. 3:228-35 '65.

1. Kievskiy institut mikrobiologii i epidemiologii.

ACC NR: AP6021580

(N)

SOURCE CODE: UR/0402/66/000/003/0348/0352

AUTHOR: Shkol'nik, L. Ya.; Shestopalova, N. M.; Zatulovskiy, B. G.

ORG: Kiev Institute of Epidemiology and Microbiology (Kiyevskiy institut epidemiologii); Institute of Poliomyelitis and Viral Encephalitis Disease, Academy of Medical Sciences, SSSR, (Institut poliomyelita i virusnykh entsefalitov AMN SSSR) ^{Moscow}

TITLE: Rickettsia prowazeki in yolk-sac cells of infected chick embryos

SOURCE: Voprosy virusologii, no. 3, 1966, 348-352

TOPIC TAGS: rickettsia, rickettsia prowazeki, rickettsial structure, electron microscopy, rickettsial disease, cell physiology

ABSTRACT:

Electron microscope studies of *Rickettsia prowazeki* revealed that *Rickettsia* have two envelopes: an exterior one (the cell wall) and an interior one (protoplasmic membrane). Within the rickettsia two kinds of granules appear, the denser variety resembling ribosomes. "Z"-type *Rickettsia* possess vacuole-like protrusions of the cell wall at various stages of detachment from the cell body. Yolk-sac cells infected with *Rickettsia* are marked by destruction of the endoplasmic reticulum, and reduction or absence of mitochondria.

[W.A. 50; CBE-No. 10]

SUB CODE: 06/ SUBM DATE: 26Mar65/ ORIG REF: 007/ OTH REF: 008/

Card 1/1

UDC: 576.851.71.094.537.533.35

The antagonistic influence of ions on the acid agglutination of erythrocytes. P. Ya. Berenshtein and M. I. Shkol'nik. *J. Physiol. U. S. S. R.* 22, 848-65 (in German) (1957) (1957). - The inhibiting effect of cations on the acid agglutination of erythrocytes is in the order $Li > Na > K > NH_4$, and for anions $SO_4 > Cl > NO_3 > I$. The inhibiting effect after the simultaneous addn. of 2 anions in glucose soln. is additive, but when 2 cations are added the effect may be less than that of the 2 cations separately or it may equal the sum of the 2 single effects. Antagonistic effects were observed for $Li + Ca$, $Li + Mg$, $Li + Ba$, $Li + Na$, $Li + K$, $Li + NH_4$, $NH_4 + Na$, $NH_4 + Ba$, $NH_4 + Ca$, $Ba + Mg$, $Ba + Ca$ and $Ca + Mg$. An additive effect was observed for $Na + Ca$, $Na + Mg$, $Na + Ba$, $Na + K$, $Ca + K$, $K + Mg$, $K + Ba$ and $K + NH_4$. $NH_4Cl + MgCl_2$ inhibits agglutination to a greater extent than NH_4Cl alone.

S. A. Karjala

1/7

RELATIVES AND PROPERTIES INDEX

the biological role of the salts of trace elements in organisms. V. The influence of copper salts on blood sugar. M. I. Shkol'nik. *J. Physiol. (U. S. S. R.)* 25, 381-7 (in German) (1957) (1958). The subcutaneous injection of CuSO_4 (I) or $\text{Cu}(\text{NO}_3)_2$ (II) (0.5-10 mg. Cu) into dogs causes a decrease in blood sugar. Doses of 0.5-5.0 mg. have the greatest hypoglycemic action, the action decreasing when 10 mg. of Cu is given. Generally, a stronger action is obtained with I than with II.

S. A. Kuz'da

ASH-11-A METALLURGICAL LITERATURE CLASSIFICATION

1957-1958

1957-1958

PROCESSES AND PROPERTIES INDEX																									
1ST AND 2ND ORDERS													3RD AND 4TH ORDERS												
<p>Effect of copper and of manganese salts on hyper- and hypoglycemia and on glycolytic activity of the blood. M. I. Shkol'nik, (Med. Inst. Vitebsk, U.S.S.R.). Byull. Eksp. Biol. i Med. 22, No. 7, 27-30 (1946) (in Russian). Subcutaneous injection of 2 mg. of CuSO_4 per kg. or 1-1.5 mg. of MnCl_2 per kg. into rabbits decreased blood sugar in alimentary hyperglucemia produced in rabbits by oral administration of 4 g. glucose/kg. and in hyperglucemia produced by adrenalin 0.5 mg./kg. In hyperglucemia produced by injection, only CuSO_4 was tested. It decreased blood sugar. Either salt increased the effect of 0.5 mouse units of insulin per kg. in producing hypoglycemia. The intensity of glucolytic action of the blood of both dogs and rabbits (died from the amt. of glucose in mg. destroyed by 100 ml. of blood during $1\frac{1}{2}$ hrs. of incubation at 40°) was increased by subcutaneous injection of CuSO_4 or of MnCO_3. Nellie M. Payne</p>																									
<p>ASR 55A METALLURGICAL LITERATURE CLASSIFICATION</p>																									

CA

11 E

Effect of zinc salts on carbohydrate metabolism. E. Ya. Berenshtein and M. I. Shkol'nik (Vitebsk Vet. Inst.) *Fiziol. Zhur. S.S.S.R.* **37**, 126-4 (1951). Subcutaneous injection into rabbits or dogs of 0.1-0.2 mg./kg. of salts of Zn did not affect blood sugar; at 0.5-5.0 dosage hyperglycemic effects appeared. $ZnSO_4$ caused increased adrenaline hyperglycemia and weakened the insulin hypoglycemia; it lowered alimentary hyperglycemia in dogs and lowered the glycolytic activity of the blood.

G. M. Kosolapoff

- sept. Biochemistry

U.S.S.R. / Human and Animal Physiology. Metabolism. T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 21924.

Author : Shkolnik, M. I.

Inst : Vitebsk Medical Institute.

Title : The Effect of Copper and Manganese on Sugar
Content. In the Blood of Narcotized Animals.

Orig Pub: Sb. Nauchn, Tr. Vitebskovo Med. In-ta, 1956,
Vp. 6, 98-106.

Abstract: In dogs and rabbits, narcotized by morphine, lum-
inal, and chlorylhydrate, (0.01, 0.03 and 0.3
gms/kg) no lowering of the blood sugar was
noted following injection of salts of cu and Mn.
(2 mg/kg weight subcutaneously as noted in non-
narcotized animals. It was concluded that the
sugar-lowering effect produced by Cu and Mn is
mediated through the central nervous system.

Card 1/1

20

T

COUNTRY : USSR
 CATEGORY : Human and Animal Physiology, Metabolism
 ABS. JOUR. : RZhBiol., No. 5 1959, No. 21671
 AUTHOR : Shkol'nik, M.I.
 INST. : Vitebsk Medical Institute
 TITLE : The Effect of Copper and Manganese on Blood Levels of Bisulfite-binding Substances at Different Functional States of the Nervous System.
 ORIG. PUB. : Sb. nauchn. rabot. Vitebskiy med. ln-t, 1957, 8, 54--60.
 ABSTRACT : After 0.5--2 mg/kg CuSO_4 or 0.5--5 mg/kg MnCl_2 was injected into dogs and rabbits, the blood levels of bisulfite-binding substances were determined. Under normal conditions injection of the microelements resulted in a certain diminution of the blood levels. Stimulating the central nervous system with an electric current or injecting camphor led to a considerable increase in the amount of these substances in the blood (from 2.94 to 6.34 mg%). Injecting Cu^{++} and Mn^{++} diminished the effect of such stimulation. When the central nervous system was depressed, the

Card: 1/2

ABS. JOUR. : RZhBiol., No. 5 1959, No. 21671

AUTHOR :
 INST.
 TITLE

"APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R001549710004

ORIG. PUB. :

ABSTRACT : microelements were without effect on blood levels of bisulfite-binding substances.--V.I. Rozengart

Card: 2/2

T-2

SHKOL'NIK, M. I.: Doc Biol Sci (diss) -- "The effect of copper and manganese on
~~the effect of copper and manganese on~~
certain biochemical processes in the animal organism (Experimental investigation)".

Minsk, 1959. 39 pp (Inst of Biology of the Acad Sci Beloruss SSR), 200 copies

(KL, No 9, 1959, 114)

SHKOL'NIK, M. I., Cand Med Sci -- "Cancer of the ^{genital} ~~sexual~~ organ.
(Clinic, diagnosis, ^{treatment} ~~therapy~~)."
KL, 3-61, 266) (Khar'kov State Med Inst)

- 547 -

SHKOL'NIK, M.I. (Khar'kov, ul.Chernyshevskogo, d.15, kv.45)

Cancer of the penis. Nov. khir. arkh. no.1:70-74 Ja-F '60.

(MIRA 15:2)

1. Urologicheskoye otdeleniye (zav. - M.I.Shkol'nik) Khar'kovskogo
oblastnogo onkologicheskogo dispansera, nauchnyy rukovoditel' -
prof. K.I.Pikin.

(PENIS__CANCER)

SHKOL'NIK, M.I.

Rupture of the bladder in a patient with cicatrical stricture of
the urethra arising from an operation for cancer. Urologia 26
no.1:64 '61. (MIRA 14:3)

(BLADDER--RUPTURE)

(URETHRA--CANCER)

SHKOL'NIK, M.I.

Bilateral single-stage removal of the inguino-femoral lymph nodes
in cancer of the penis. Vop. onk. 6 no.7:86-90 Je '60.

(MIRA 14:4)

(PENIS--CANCER)

(LYMPHATICS--SURGERY)

SHKOL'NIK, M.I.

Effect of various amounts of the trace element copper on the activity of some digestive enzymes. Uch. zap. Petrozav. gos. un. 12 no.3:126-128 '64.

Effect of copper and manganese on the blood sugar content following the transection of vagus and splanchnic nerves. Ibid.:133-135

Effect of various cobalt salts on the activity of some digestive enzymes. Ibid.:136-140

Effect of copper and manganese on the blood content of sugar following the administration of some sympathicotropic and vagotropic substances. Ibid.:141-143

(MIRA 19:1)

1. Kafedra biologicheskoy i organicheskoy khimii Petrozavodskogo gosudarstvennogo universiteta imeni O.V.Kuusinena.

SHKOL'NIK, M.I.; CHEREPOVA, S.I.

Effect of various salts of the trace element manganese on the
activity of some digestive enzymes. Uch. zap. Petrozav. gos.
un. 12 no.3:129-132 '64. (MIRA 19:1)

1. Kafedra biologicheskoy i organicheskoy khimii Petrozavodskogo
gosudarstvennogo universiteta imeni O.V. Kuusinenena.

CA

116

The influence of boron and other accessory elements on the development of flax. M. Ya. Shkolnik. *Bull. acad. sci. U. R. S. S., Classe sci. Math.* 1933, No. 8, 1103-88. - Normal plant growth of flax was obtained when there were added per l. of nutrient mixt.: B 0.5-1 g., Mn 0.0015 g., Al 0.0005 g., Cu 0.000125 g. and I 0.00025 g. None of these elements improved the growth of flax when B was absent.
V. D. Karpenko

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																										11D																									
<p>CA</p> <p>The physiological role of boron. M. Ya. Shkolnik. <i>Compt. rend. acad. sci. U. R. S. S. [N. S.]</i> 171:311 English 143-6 (1934). - Boron increases root growth of flax and <i>Vicia faba</i>, decreases the permeability of the plasma and the absorption of NO_3, PO_4 and Ca ions but increases absorption of K ions. F. H. Rathmann</p>																																																			
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			

ca

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PROCESSES AND PROPERTIES INDEX

Effect of boron upon the development of flax in water and soil cultures. M. Ya. Shkolnik. *Compt. rend. acad. sci. U. R. S. S.* 2, 104-6 (in English 107-9) (1934); cf. C. A. 28, 3103⁴.—The addn. of 0.4-1.6 mg. B per kg of soil increases the yield of flax 21.5-22.8% (calcd. on air-dry wt.). B is not a stimulator of growth, but a prime essential to the development of flax. C. W. S.

CA

110

The need of plants for boron. M. Ya. Shkol'nik.
*Compt. rend. acad. sci. U. R. S. S. 2, 105-70 (in English
170-30) (1935), U. S. A. 28, 5100.* It is indispensable
for the growth of hemp, sunflower, *Perilla ovynodes*, and
lucerne. The action of B on wheat is comparatively
weak. In the absence of B Sudan grass suffers chlorosis
and a great lag in growth, from which it recovers up to
seedling time. The seed yield is markedly reduced.
Philip D. Adams

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCEDURES AND PROPERTIES INDEX																										PROCEDURES AND PROPERTIES INDEX																									
<p>The effect of microelements on the drought resistance and the salt resistance of plants and on the chemical composition of grain. M. Ya. Shkol'nik. <i>Sov. Botan.</i> 1939, No. 6, 218-33. <i>Khim. Referat. Zhur.</i> 1940, No. 6, 44-5. The effect of B, Mn, Cu, Zn and Al (0.7-5.0 mg. per kg. of soil) on the yield of wheat and barley grown on soil cultures was investigated under the following conditions: (1) artificial drought (discontinuing of watering) during various periods of vegetation; (2) satn. of the soil with NaCl; (3) satn. with NaCl + drought during the period of shooting into ears; (4) insufficient moisture of the soil during the whole vegetation period; (5) excessive moisture of the soil during the same period. In the presence of Mn the drought resistance of plants increased under nearly all conditions of drought (the yield of grain in expts. with barley was by 3-70% greater in the presence of Mn than in the control plants). The effect of B was analogous only when the plants were subjected to drought during the period of the formation of ears (a 65% increase of the yield of barley was obtained). Cu, Zn and Al lowered the yield of wheat by 30-60% under drought conditions. B, Mn and Al increased the yield of wheat by 18-34% in soils satn. with NaCl. Excessive moistening of the soil increased the yield of barley by 40% on the addn. of B and decreased it by 20% on the addn. of Mn. The contents of sol. carbohydrates, starch and protein N in the grains of barley under drought conditions during various periods of vegetation increased considerably under the influence of Mn, B, Cu and Zn. W. R. Henn</p>																																																			
<p>AS 5-51 A METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
<p>1939-1940</p>																																																			

The influence of boron and phosphorus on the growth, blossoming and fruit setting of the lemon. M. Yu. Shkol'nik, V. K. Abashkin and M. P. Grininger. *Exptl. Botan.*, No. 4, *Trudy Botan. Inst. Acad. Sci. U. S. S. R.*, Ser. IV, 111-25 (in English, 125-0) (1940).—Addns. of 0.3 mg. of B per kg. of soil on 3-year-old lemons grown in vats contg. 12 kg. of soil increased, in 1936, the quantity of branches by 10% and of leaves by 50%. Addns. of P_2O_5 in conjunction with the B did not influence the branch and leaf growth. An increase in total and sol. carbohydrates in the young and old leaves was noted in trees treated with B. Smaller increases were obtained by the addn. of P alone. Addns. of 0.8 mg. of B, with or without P, had a depressing effect on growth, but this quantity of B in combination with P gave the highest total and sol. carbohydrates. In 1937 the addns. of 0.3 mg. B increased the no. of flowers with or without P. With a high B addn. (0.8 mg.) the low P addn. reduced the depressing effect of B alone. An increase in fruit production was also noted with the B. P alone increased the citric acid content. The combination of B and P decreased the citric acid content.

J. S. Joffe

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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LA

11D

Influence of microelements on the carbohydrate metabolism of plants. M. Ya. Shkol'nik, N. A. Makarova, and M. M. Steklova (Acad. Sci. U.R.S.S., Leningrad). *Botan. Zhur.* 32, 238-53(1947); *Chem. Zentr.* 1948, II, 1031; cf. *C.I.* 44, 7039. - Timothy seeds were planted dry or after soaking in water (controls); the seeds were treated with solutions of B (150 and 1000 mg./l.), Mn (150 and 2000 mg./l.), Zn (150 and 700 mg./l.), or NaCl (0.025 M); B and Mn were mixed with the soil; both soil and seeds were treated with B or Mn; the soil was top-fertilized with B or Mn. Monosaccharides, sucrose, maltose fraction, and starch were determined in the total plant parts above ground as well as in leaves and stems. Treatment of the soil and seed with Mn or B and treatment of seed with Zn had a marked influence on the carbohydrate exchange in the plants, increasing the content of monosaccharides, sucrose, and starch. NaCl treatment increased only the sol. carbohydrates. Addition of the microelement increased the ratio (starch:sol. carbohydrates) in the leaves. The content of mobile carbohydrates, monosaccharides and sucrose in the stems was likewise increased. The microelements thus influenced the transport of these substances. On the basis of these findings and earlier work (which is reviewed), it is concluded that the important trace elements (B, Mn, Zn, Cu, Al, Mo) cannot be replaced in their direct effects, especially as regards catalytic reactions. On the other hand, many of the effects of these trace elements are nonspecific. This is particularly true of their influence on physiochem. processes and on the properties of the plasma colloids, as well as on photosynthesis. B appears to be the trace element of greatest influence.

M. G. Moore

1951

Labile substances of acyl phosphate type in green plant leaves. A. M. Kuzin and M. Ya. Shkol'nik. *Doklady Akad. Nauk S.S.S.R.* 59, 941-4 (1948). Substances of acyl phosphate type are detectable in green leaves by using the Lipmann-Tuttle hydroxamic acid test with NH_2OH (C.A. 39, 52109). The fresh leaves were ground in acetate buffer (pH 5.4) in the presence of 0.5 ml. NH_4OH soln. (made by mixing 28% NH_4OH -HCl soln. with 14% NaOH) and a little ground glass; after 10 min. at room temp., proteins and pigments were removed with trichloroacetic acid, and 1 ml. of the filtrate was treated with 0.5 ml. 5% FeCl_3 in 0.1 N HCl and the soln. examd. photometrically. The highest amt. of the active material was found in leaves of *Polamogeton perfoliatus* (300 micromoles per 100 g.), *Tradescantia* gave 150-180, sugar beet 52, nasturtium 60, tomato 64, and wheat sprouts 42. If the specimens were heated 5 min. to 100° after grinding almost all of the active matter was absent (0-3 units). Similar but slower effect was observed in allowing the ground preps. to stand up to 2 hrs. The intact leaves, however, appear to preserve the labile matter intact. The behavior of the material substantiates the acyl phosphate hypothesis. G. M. Kosolapoff

SHVCHENIK, N. Ya.

"Mineral Feeding—an Important Factor in Obtaining Controlled Changed in Plants,"
Priroda, No. 7, 1949. Dir. of Biol. Sci.

CA

11-0

The influence of trace elements in increasing the resistance of plants to salt, and its causes. M. Ya. Shkolnik, N. A. Makarova, and M. M. Steklova. *Bolsh. Zhur.* 34, 85-94(1949); *Chem. Zentr.* 1950, I, 308.—The trace elements increase the plant's ability to withstand high salt contents. They increase the content in osmotically active org. substances (sugars). This results in an improvement in the water supply (in the plant) and increases the stability of the plasma colloids. The trace elements keep the synthesis of carbohydrates at a high level under unfavorable environmental conditions. They prevent the entrance of salts into the cells, have a direct effect on the biocolloids, and correct disturbances of the phys.-chem. condition caused by high salt contents. M. G. Moore

110

Antagonism of boron and copper. M. Ya. Shkolnik
and N. A. Makarova. *Doklady Akad. Nauk S.S.S.R.*
68, 1858:1949. —Hydroponic culture of flax in Knop
mxt. solu. with B added gives much less vigorous
growth if traces of Cu are present (a still made of Cu sheet-
ing is used instead of a glass still). The results indicate
that B is capable, to some extent, of neutralizing the toxic
effect of Cu. Absence of B leads to chlorosis in flax, but
this is largely caused by trace amts. of Cu introduced into
the feed H₂O by materials of construction. Similar results
are obtainable with bean and sunflower cultures.
G. M. Kosolapoff

BA
BIV

Section 1

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Differences in boron and zinc requirements of plants in different environmental conditions. M. Ya. Shkolnik and N. A. Alakarov (C. R. Acad. Sci. URSS, 1949, 68, 409-412) — The toxic effect of traces of Cu on sunflower seedlings grown at 20-30° is virtually absent at 9-12°. Traces of B or Zn counteract the effect of Cu at the higher temp. R. TRUSCOR

CA

11D

Possible reasons for different boron requirements in mono- and dicotyledonous plants. M. Ya. Shkol'nik and N. A. Mikarova. *Doklady Akad. Nauk SSSR* 68, 613-616 (1990). The 2 plant groups, represented by flax, sunflower, broad bean on one hand, and oats, wheat, barley, on the other hand, were grown in the presence of Cu (0.1-10 mg. l. added to the distd. H₂O culture). The 1st group which has a high B requirement suffered severely with increased Cu levels in respect to growth and appearance, even at 0.5 mg. Cu level, while the 2nd group gave but a small repression at 2-10 mg. levels. Thus, the B requirement, at least in part, is part of a protective mechanism against the toxic effects of Cu. G. M. K.

Inst. Botany im. V.L. Komarov, AS USSR

SHKOL'NIK, M. Ya.

The Significance of Microelements in the Life of Plants and in Agriculture,
Botanical Institute imeni V. L. Komarov. Moscow-Leningrad; 1950, 512 pp.

Book W-22202, 7 Apr 52

CA

11D

Antagonism of iron and copper. M. Ya. Shkol'nik and N. A. Makarova. *Doklady Akad. Nauk S.S.S.R.* 70: 121-4 (1950); cf. *C.A.* 44, 7106. — If Cu-free hydroponic culture of

flax or sunflower, kept on Knop mixt. contg. 25 mg./l. Fe, is supplied with various amts. of Cu with or without added 200 mg./l. Fe (or 100 mg./l.) a striking antagonism between Fe and Cu is revealed. Fe is a stronger antagonist than B. At 0.5 mg./l. Cu the plants develop chlorosis if a low Fe level is maintained; with added Fe normal development occurs, and even supernormal crops of the superterranean parts are obtained, especially with the 100-mg. dosage of Fe. The increase at times reached 100%. B alone or in presence of both Fe and Cu lowers the H₂O content of plants, but in the presence of Cu alone it increases the extent of hydration. In effect, Fe may partially replace the B requirements of these plants. G. M. Kowalski¹⁷

CA

11D

Entry of phosphorus and potassium into plants at different temperatures in plants differing in boron requirements. M. Ya. Shkol'nik and M. M. Steklova (V. L. Komarov Botani. Inst., Acad. Sci. U.S.S.R.). *Doklady Akad. Nauk S.S.S.R.* 72, 1171-4(1950).--Cultures of wheat (low B requirement) and flax (high B requirement) grown at first in B-contg. cultures for 25 days, then transplanted to B-free culture (controls contained B) and grown under higher (10-16° with 21-31° max.) temp. or lower temp. (10-15°, max. 12-17°), showed an opposite effect of B on wheat or flax growth at the different temps. At higher temp. B raised flax yield and lowered it at low temp.; wheat gave opposite result. At low temp. flax free from B showed little decline in P intake, while in wheat this was considerable; K intake was lowered. B and Zn drop the P intake in both plants at high or low temp. In the 1st 3 days Zn, contrary to B, increases P intake of flax at high temp. At high temp. with flax free from B K intake is very low at high temp. over the 1st 6 days, while in wheat it is high; renewal of the nutrient soln. at this time leads to rise of K intake in flax and a drop in wheat. At low temp. the variations are much less clear. Thus the monocotyledonous plant (wheat) is better adapted to sharp variations of mineral diet than a dicotyledonous plant (flax). G. M. Kosolapoff

CA

11

Physiological role of boron in plants. M. Ya. Shkol'nik
and M. M. Steklova. *Doklady Akad. Nauk S.S.S.R.* 77:
137-40 (1951); cf. *Exptl. Bot.* 8 (1951): C.A. 28, 5100;
44, 7889c. - Expts. with flax plants showed that in the
complete absence of B, plants can be made to develop strong
and fully normal root systems and to behave as perfectly
normal specimens if H_2O_2 is introduced into the nutrient
medium. Aeration alone is very poorly effective in this
respect and gives subnormal development. H_2O_2 was added
daily at the rate of 3 drops of 1-10% H_2O_2 per 2 l. of medium,
with 5% soln. being approx. optimum. The H_2O_2 -treated
plants gave a somewhat lower total yield of flax than the
specimens kept in the presence of B, but the over-all ap-
pearance and behavior of the plants were normal and healthy.
Thus the main role of B is to improve the O supply of the
plant tissues, and particularly of the root systems. Pos-
sibly this action is connected with facilitation of formation
of org. peroxides in the presence of B within the plant.
G. M. Kresolapoff